

STOCK NOS. 2301 0010  
2301 0011  
2301 0030  
2301 0031

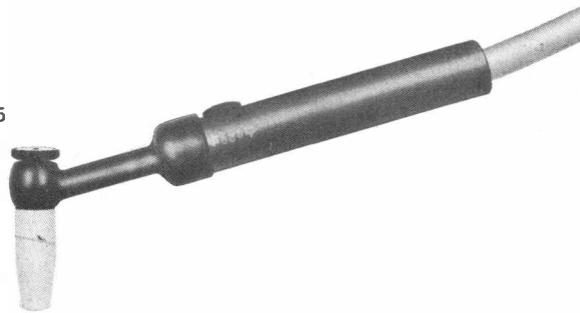
INSTRUCTIONS  
AND PARTS  
2A0010

# AIR-COOLED MANUAL

## Heliweld<sup>®</sup> HOLDER

MODELS H10-A AND H10-B

7095



ADI 1223E

FEBRUARY 1968



INSTALLATION

OPERATION

MAINTENANCE

BE SURE THESE INSTRUCTIONS REACH YOUR OPERATOR.

---

## WARRANTY

---

This equipment is sold by Air Reduction Company, Incorporated (Airco) under the warranty set forth in the following paragraph. Such warranty is extended only to the buyer who purchases the equipment directly from Airco or its authorized distributor as new merchandise.

This equipment is warranted by Airco to be free from manufacturing defects for 90 days after delivery by Airco, provided that it is properly operated under conditions of normal use and that regular periodic maintenance and service is performed, except that such warranty is limited to 30 days with respect to expendable parts and, for parts that are purchased by Airco, to the period granted to Airco by the vendor of these parts. Airco's sole obligation under this warranty is limited to making replacements at its nearest designated repair location for equipment or parts which are returned to it with transportation charges prepaid and which, upon Airco's examination, have been found to be so defective. Airco shall not be liable for consequential damages or special damages.

The foregoing warranty shall not apply if this equipment has been repaired or altered by anyone other than an authorized Airco representative or if the equipment has been subject to abuse, misuse, negligence, or accident. *There are no warranties which extend beyond the description of this equipment contained in this manual, other than the foregoing warranty. Airco makes no warranty of merchantability in respect to this equipment.*

---

## USER RESPONSIBILITIES

---

This equipment will perform safely and reliably only when installed, operated, maintained, and repaired in accordance with the instructions in this manual. Equipment must be checked periodically and replaced, or reset as necessary to insure continued safe and reliable performance. Parts that are broken, missing, plainly worn, distorted, or contaminated should be replaced immediately with parts that are manufactured or sold by Airco. The equipment or any of its parts should not be modified without the prior written approval of Airco's Equipment Engineering and Development Department. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, or repair by anyone other than Airco or from parts that have been damaged or modified by anyone other than Airco.

## I. INTRODUCTION

### 1.1 SCOPE

This manual provides installation, operation, and maintenance information, and spare and replacement parts lists for the Models H10-A and H10-B HELIWELD® Holder. Additional information is available in manuals covering equipment with which the Holder is used.

### 1.2 DESCRIPTION

The Holder is designed for manual welding applications. It is a sturdy, lightweight, air-cooled, welding tool available with either a 12-foot (stock nos. 2301 0010 or 2301 0011) or 25-foot long (stock nos. 2301 0030 or 2301 0053) cable and hose assembly. Models H10-A and H10-B Holders are alike except that Model H10-B has a thumb-operated valve built into the handle for on-off control of gas flow.

The dimensions of the Holder and its accessories are provided in Figure 1. Other Holder specifications are listed in Table I.

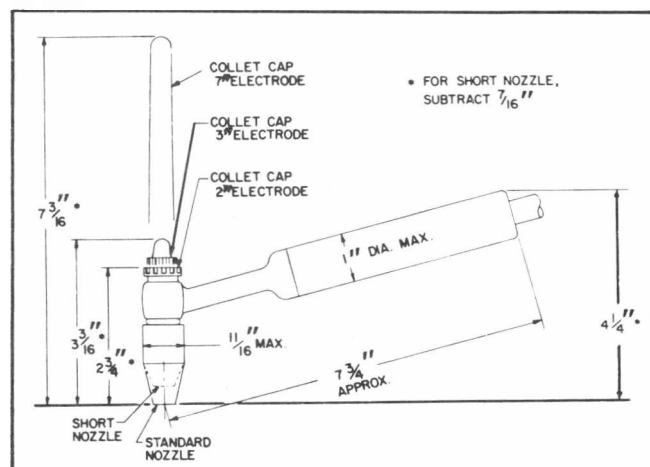


Figure 1. Dimensions

TABLE I. Holder Specifications

Weight of Holder Body	4 oz.
Current Rating, 100% Duty Cycle	100 amp AC or DCSP
Electrode Accommodation	up to 7 in. lg, 0.020 to 3/32 in. dia

### 1.3 ACCESSORY EQUIPMENT

Items required to adapt the Holder to particular job conditions are accessories. These include collets, collet caps and nozzles (Tables IV, V and VI).

### 1.4 AUXILIARY EQUIPMENT

Auxiliary equipment comprises items required, in addition to accessories, to complete a typical welding installation. Such equipment includes flash goggles (medium shade, stock no. 1306 2101), helmet, gloves, welding cables, gas supply hose and fittings, regulator and flowmeter, shielding gas, tungsten electrode, high-frequency oscillator, power source, and secondary contactor if the power source does not contain a primary one. In most cases, auxiliary items have instruction manuals which describe their function and operation.

### 1.5 OPTIONAL EQUIPMENT

To convert the Model H10-A to a Model H10-B gas-valve Holder, a conversion kit (stock no. 2310 0556) is available as optional equipment.

## II. INSTALLATION

### 2.1 SERVICE CONNECTIONS

#### 2.1.1 SHIELDING GAS

Connect a shielding-gas supply to the Holder as follows:

- Provide a clean 3/16-inch ID supply hose.

#### IMPORTANT

Do not use hose which has been previously used for compressed air or water because it may

contain globules of oil and other foreign matter which will contaminate the shielding gas.

- Attach a gland (stock no. 803 0245) with a nut (stock no. 803 0255) to the hose (Figure 2).

#### NOTE

The gland and nut are not included with the Holder but are available from your AIRCO representative.

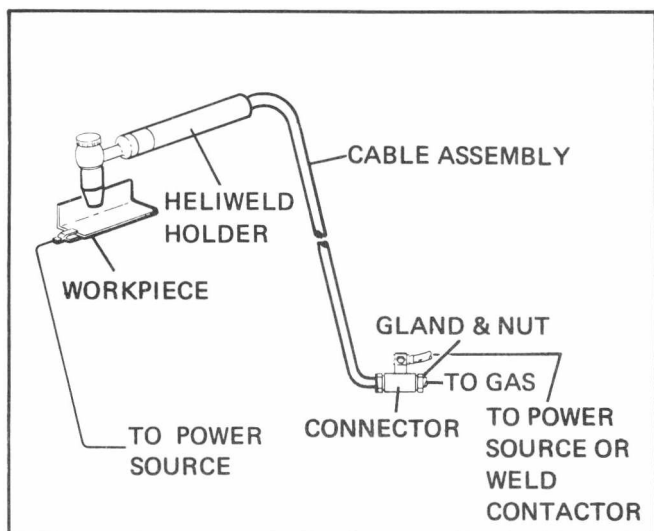


Figure 2. Interconnections

c. Connect the hose and gland assembly to the connector.

d. For proper control, meter shielding gas through a flowmeter. Determine approximate gas flow from Table II.

## 2.1.2 WELDING CABLE

See Table III to determine the proper size of copper welding and ground cables to be used.

### CAUTION

When using high-frequency oscillation, refer to the high frequency preventive measures section of the oscillator or power supply manual.

Securely bolt the welding cable to the connector.

TABLE II. Electrode and Nozzle Size Selection Guide

Electrode Dia (in.) (Note 1)	Nozzle Orifice Size (in.)	Gas Flow (cfh)	Direct Current (amps)		Alternating Current-High Frequency (amps)			
			Straight Polarity	Reverse Polarity	Unbalanced Wave		Balanced Wave	
			Thoriated Tungsten 1 & 2%	Thoriated Tungsten 1 & 2%	Pure Tungsten	Thoriated Tungsten 1 & 2%	Pure Tungsten	Thoriated Tungsten 1 & 2%
0.010	1/4	10	Up to 15	---	Up to 15	Up to 15	Up to 15	Up to 15
0.020	1/4	10	5-20	---	5-15	5-20	10-20	5-20
0.040	1/4-3/8	10-15	15-80	---	10-60	15-80	20-30	20-60
1/16	3/8-1/2	10-15	70-150	10-20	50-100	70-150	30-80	60-120
3/32	3/8-1/2	15-20	150-250	15-30	100-160	140-235	60-130	100-180
1/8	3/8-1/2	15-40	250-400	25-40	150-210	225-325	100-180	160-250
5/32	1/2-5/8	20-50	400-500	40-55	220-275	300-400	160-240	200-320
3/16	1/2-5/8	30-80	500-750	55-80	250-350	400-500	190-300	290-390

- NOTES:
1. This Holder may not accommodate all electrodes listed.
  2. This table is a guide, since conditions governing particular applications may vary enough to change the above selections.
  3. All values were obtained by using argon as the shielding gas.
  4. Zirconium-tungsten electrodes can be used with dc straight polarity or ac power. Their usable current ranges would fall between those recommended for pure and thoriated tungsten.
  5. A mixture of 75 percent helium and 25 percent argon can be used with both types of welding current and with all types of tungsten electrodes.
  6. Electrode current-carrying capacity may be greater than that of the Holder.
  7. If the electrode is pointed, the minimum current rating can be reduced.

TABLE III. Copper Welding Cable Size Selector Guide

Amps	Distance From Power Source (Feet)						
	50	75	100	125	150	175	200
100	2	2	2	2	1	1/0	1/0
150	2	2	1	1/0	2/0	3/0	3/0
200	2	1	1/0	2/0	3/0	4/0	4/0

## 2.2 SELECTION

Items to be selected are electrodes, collets, collet caps and nozzles. Choose the size electrode to be used from Table II and the collet from Table IV. If access to the joint is limited, it may be desirable to choose a collet cap for a 2- or 3-inch long electrode (Table V) and a short nozzle. If there is no space problem, a collet cap for a 7-inch long electrode and a standard nozzle should be used. To select the proper nozzle, see Tables II and VI.

TABLE IV. Collet Selection

Electrode Dia (in.)	Collet Stock No.
.020	2304 0138
.040	2304 0137
1/16	2304 0136
3/32	2304 0135

TABLE V. Collet Cap Selection

Electrode Length (in.)	Collet Stock No.*
2	2304 0008
3	2304 0009
7	2304 0010

\*Includes O-ring, stock no. 2310 0040

TABLE VI. Nozzle Selection

Length (in.)	Orifice Size (in.)	Nozzle Stock No.
Standard 1-9/16	1/4	2304 0069
	5/16	2304 0070
	3/8	2304 0073
	7/16	2304 0074
Short 1-1/8	1/4	2304 0071
	5/16	2304 0072

## 2.3 ELECTRODE INSERTION

### IMPORTANT

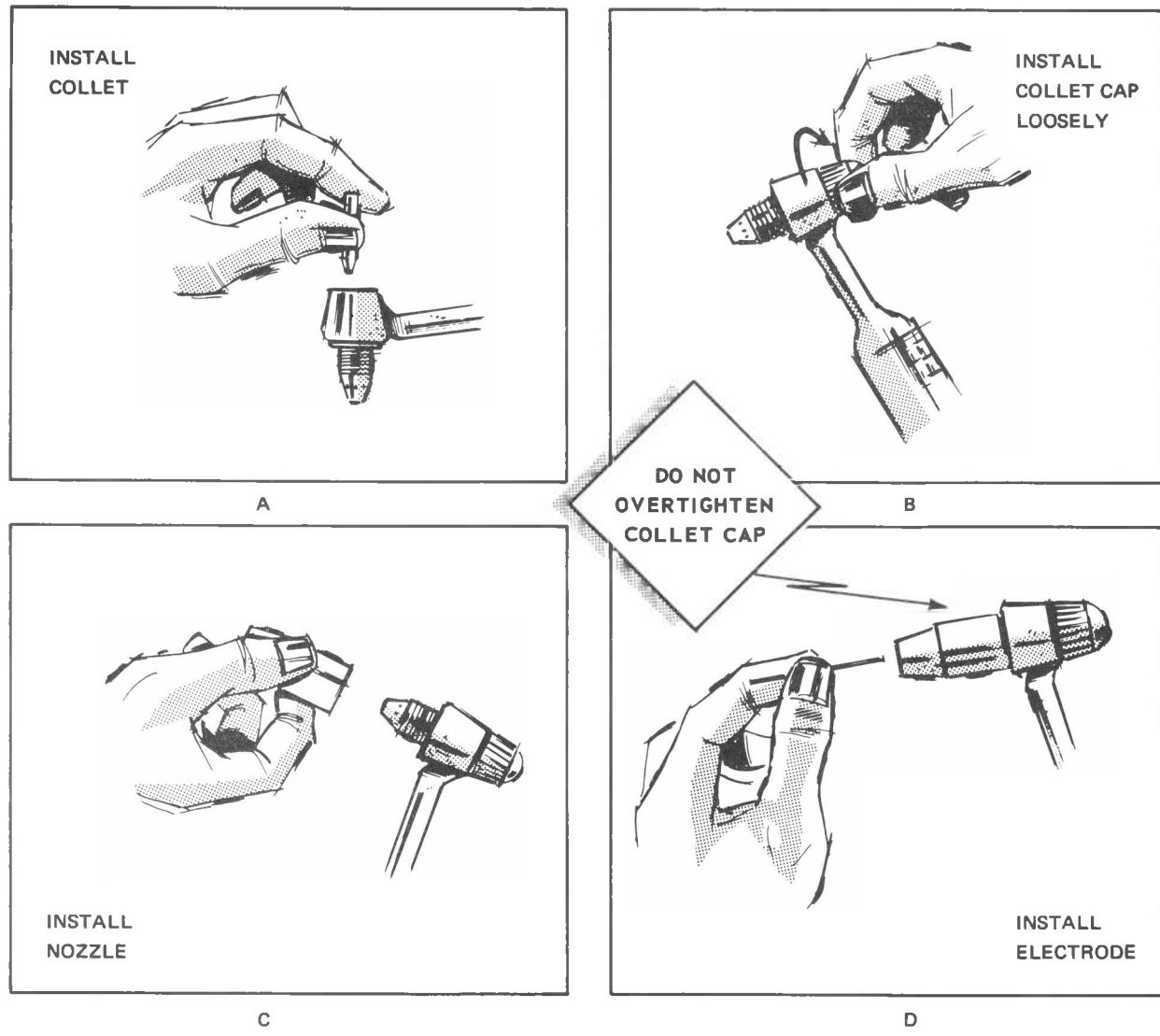
Keep the electrode and collet free from dirt and burrs to prevent a loose or poorly aligned electrode.

Install electrode as follows:

- Drop collet, beveled end down into the Holder body head (Figure 3, view A).
- Screw the collet cap into the Holder body; do not tighten (view B).
- Screw the required size nozzle (Table VI) onto the Holder body so that it seats snugly against the o-ring (view C).
- With the collet cap screwed loosely on the Holder body, insert the electrode through the nozzle into the collet (view D).
- Adjust the electrode so that it projects the proper distance from the nozzle end (usually 1/8- to 3/16-inch) and tighten the collet cap to clamp the electrode in place.

### IMPORTANT

To prevent damage to the collet, avoid excessive tightening of the collet cap.



*Figure 3. Preparing Holder For Use*

### III. OPERATION

#### 3.1 SAFETY REQUIREMENTS

Comply with all ventilation, fire, and other safety requirements for arc welding as established for industrial applications. Reference as applicable: *Safety in Welding and Cutting*, United States of America Standard Z49.1, 1967; *Recommended Safe Practices for Gas-Shielded Arc Welding*, American Welding Society Bulletin A6.1, 1966; *Fire Prevention in Use of Cutting and Welding Processes*, NFPA Standard No. 51B, 1962.

a. Because of infrared and ultraviolet radiation emitted by the high-intensity welding arc, the operator must, and nearby personnel should, use flash goggles in addition to helmets.

b. Do not weld where chlorinated hydrocarbon vapors from degreasing, cleaning, or spraying will reach or be drawn into the atmosphere surrounding the welding operation. The heat of the arc can decompose the solvent vapors to form phosgene, a highly toxic gas, and other irritating decomposition products.

c. Do not weld where the ultraviolet light from the arc can penetrate atmospheres containing even minute amounts of vapors from solvents such as perchloroethylene or trichloroethylene to cause decomposition to phosgene and other irritating products.

d. The electrode and all metal parts in contact with it, are electrically energized while welding, requiring periodic

inspection for defective insulation and other electrical hazards.

#### CAUTION

Before inspection and whenever steps are taken to remove and repair electrical hazards, place all power controls OFF and disconnect all electrical cable from power supplies.

#### 3.2 PRE-WELD PROCEDURE

a. Start gas flow and adjust the flow rate at the flowmeter (Table II). On Model H10-B only, slide the gas control valve button on the handle back towards the hose assembly to ON for gas flow.

b. After the initial installation, and after extended layoff periods (overnight, etc.) allow gas to flow freely for about 30 seconds to purge air from the line before beginning to weld. This will prevent air, dust or moisture in the line from contaminating the weld.

c. Set the power source for the required current range and turn ON.

d. Start to weld.

#### IMPORTANT

Exceeding the current rating of the Holder for extended periods will damage the Holder.

### IV. MAINTENANCE

#### IMPORTANT

Checking or repair of this equipment may ordinarily be undertaken by a competent individual having at least general experience in the maintenance and repair of equipment of this nature. No such checking or repair should ever be undertaken or attempted by anyone not having such qualifications.

#### CAUTION

To avoid electric shock when undertaking maintenance, be sure Holder is disconnected from power source.

#### 4.1 HOSES AND CONNECTIONS

Gas leaks may develop if connections to the Holder are loose or faulty or the hose is damaged.

To expose connections, unscrew the Holder handle and slide the handle back along the gas hose and cable assembly.

If faulty connections are found, remove the hose and repair or replace connections. If the hose is damaged at a connection it is recommended that the entire Holder be sent to your local authorized AIRCO repair station, as special tools and techniques are required. All other damaged hoses should be replaced.

## 4.2 WELDING CABLE

Frayed or damaged cable should be replaced immediately. To determine the correct cable size, consult the Copper Welding Cable Size Selection Guide (Table III).

## 4.3 NOZZLES

Nozzles should be replaced if they are burned, burred, roughened on their inner surfaces by spatter, or otherwise damaged. This will assure a consistently uniform gas flow from the nozzle to the work.

## 4.4 O-RINGS

O-rings are made of a temperature-resistant material. They require no care other than periodic inspection for damage which might cause leakage. They must be replaced if they are cracked, burned, or otherwise damaged.

O-rings can be removed by simply rolling them from their seats. If they have become stuck, pry them off but *do not use a sharp metal instrument, since this may score the seats and cause leakage.*

# V. SPARE AND REPLACEMENT PARTS

## 5.1 SPARE PARTS

To assure minimum downtime, it is recommended that the spare parts listed in Table VII be kept on hand.

TABLE VII. Spare Parts

Item	Qty	Stock No.
Nozzle	3 of each size used	See Table VI
Collet	3 of each size used	See Table IV
Collet Cap	1 of each size used	See Table V
O-ring, Collet Cap	3	2310 0040
O-ring, Nozzle	6	2310 0019

## 5.2 REPLACEMENT PARTS

The following drawings of the Holder, identify each replacement part by item number as tabulated in the related parts list. Each list also identifies each part by stock number, name, and quantity used. Item numbers are called out in order of disassembly. Item descriptions preceded by

a dot are part of the item above with no dot; items with two dots are part of the item above with one dot.

Items followed by code A are part of assembly 2301 0010 or 2301 0011 only. Items followed by code B are part of assembly 2301 0030 or 2301 0031 only.

### NOTE

All hardware is cadmium plated steel unless otherwise noted.

Items not listed on the parts lists are included in Table VII.

## 5.3 ORDERING INFORMATION

To assure proper operation and protect any warranty, use only genuine AIRCO parts and products with this equipment. To order replacement parts, proceed as follows:

- Give stock number and name of equipment on which the parts are to be used.
- Be sure to give the stock number, part name, and quantity of each part required.
- Indicate any special shipping instructions.



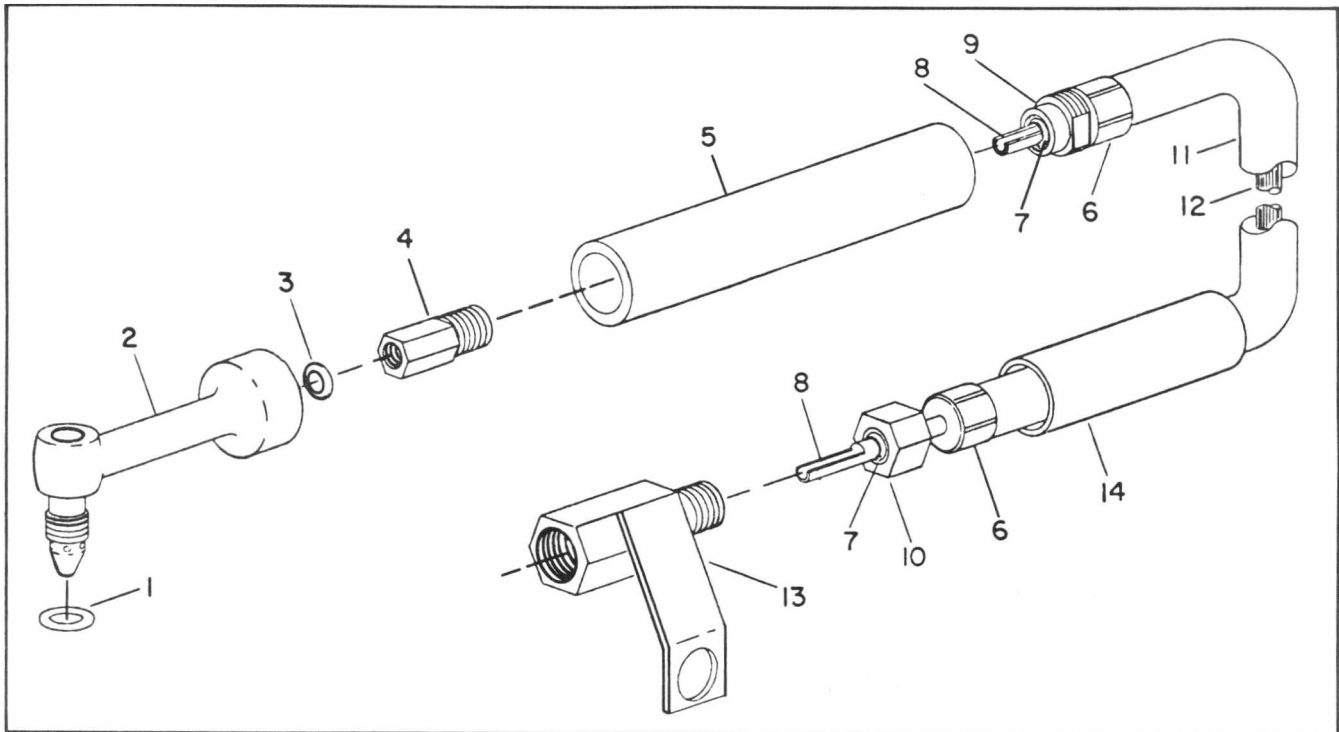


Figure 4. Model H10-A HELIWELD Holder

ITEM NO.	STOCK NO.	1 2 3 4	DESCRIPTION	QTY	CODE
	2301 0010		MODEL H10-A HELIWELD HOLDER (12 ft hose assy)	1	A
	2301 0030		MODEL H10-A HELIWELD HOLDER (25 ft hose assy)	1	B
1	2310 0019	.	O-RING, Nozzle	1	
2	2310 1834	.	HOLDER BODY	1	
3	830 1306	.	O-RING, Body	1	
4	2310 0018	.	NUT, Spacer	1	
5	2310 1841	.	HANDLE	1	
	2310 1845	.	HOSE ASSY, 12 Ft*	1	A
	2310 1844	.	HOSE ASSY, 25 Ft*	1	B
6	2310 1838	.	FERRULE	2	
7	2389 3599	.	SLEEVE, Compression	2	
8	2310 1840	.	GLAND	2	
9	2310 0012	.	NUT, Holder End	1	
10	2310 0014	.	NUT, Weld Cable End	1	
11	2310 1892	.	HOSE, 1/4 ID x 12 Ft	1	A
	2310 1889	.	HOSE, 1/4 ID x 25 Ft	1	B
12		.	CABLE, Welding, No. 7, 12 ft, 2-1/4 in.*	1	A
		.	CABLE, Welding, No. 7, 25 ft, 2-1/4 in.*	1	B
13	2310 1645	.	CONNECTOR ASSY	1	
14	2310 1643	.	SLEEVE	1	

\*Order by foot

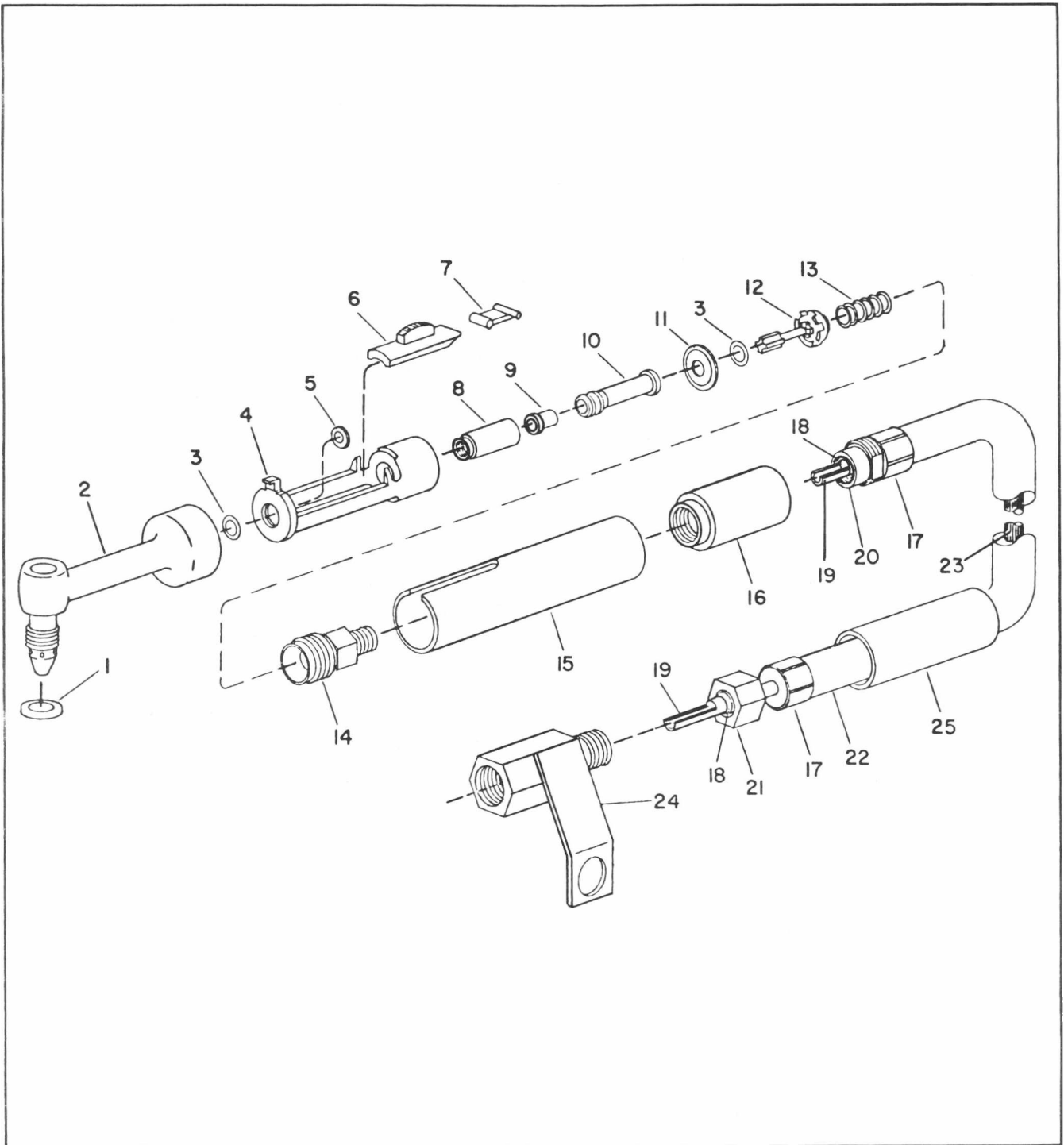
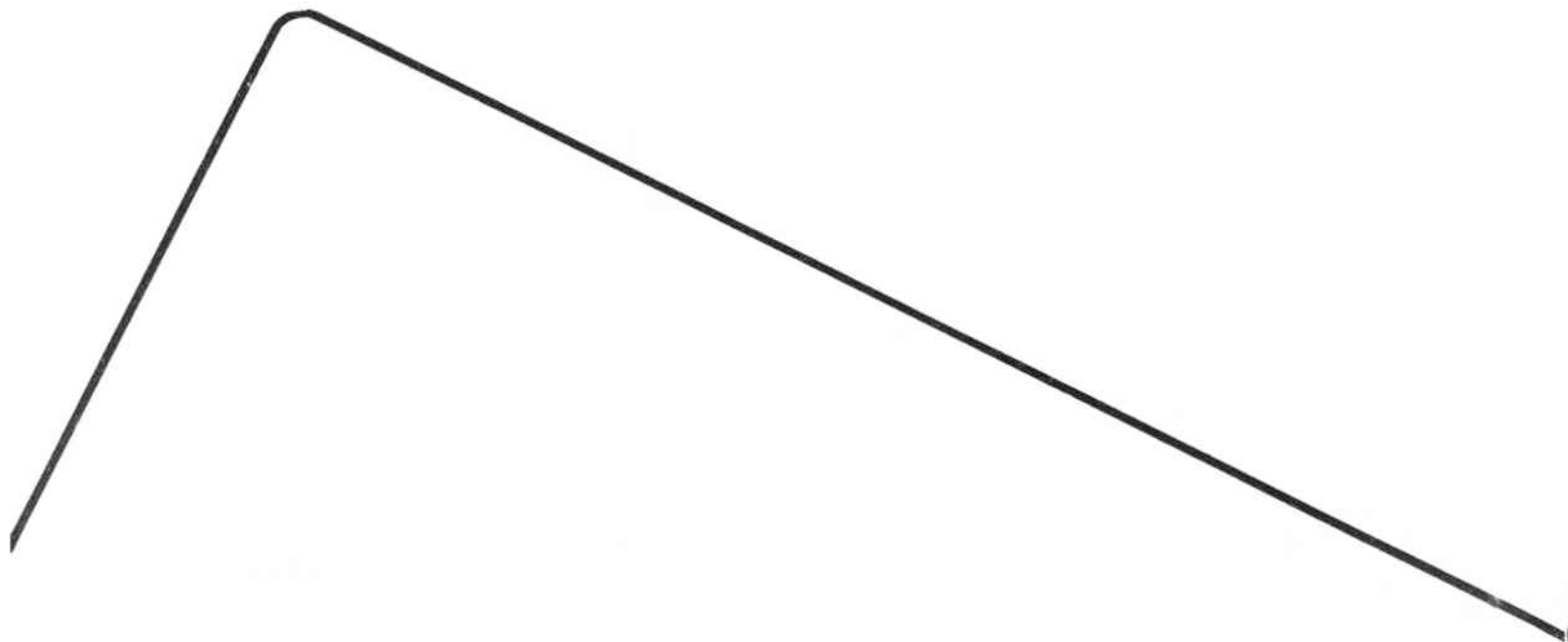


Figure 5. Model H10-B HELIWELD Holder

ITEM NO.	STOCK NO.	1 2 3 4	DESCRIPTION	QTY	CODE
	2301 0011		MODEL H10-B HELIWELD HOLDER (12 ft hose assy)	1	A
	2301 0031		MODEL H10-B HELIWELD HOLDER (25 ft hose assy)	1	B
1	2310 0019	.	O-RING, Nozzle	1	
2	2310 1835	.	HOLDER BODY	1	
3	830 1306	.	O-RING, Body	2	
4	2310 0033	.	BODY, Valve	1	
5	2310 0404	.	WASHER	1	
6	2310 0027	.	BUTTON, Valve	1	
7	2310 0028	.	LEVER, Valve	1	
8	2310 0026	.	NUT ASSY	1	
9	2310 0022	.	BUSHING	1	
10	2310 0034	.	HOSE, Valve	1	
11	2310 0025	.	WASHER	1	
12	2310 0024	.	BODY, Rocker	1	
13	2310 0030	.	SPRING	1	
14	2310 0032	.	BLOCK, Conn	1	
15	2310 1842	.	HANDLE	1	
16	2310 1843	.	BUSHING, Lock	1	
	2310 1845	.	HOSE ASSY, 12 Ft*	1	A
	2310 1833	.	HOSE ASSY, 25 Ft*	1	B
17	2310 1838	.	FERRULE	2	
18	2389 3599	.	SLEEVE, Compression	2	
19	2310 1840	.	GLAND	2	
20	2310 0012	.	NUT, Holder End	1	
21	2310 0014	.	NUT, Weld Cable End	1	
22	2310 1892	.	HOSE, 1/4 ID x 12 Ft	1	A
	2310 1889	.	HOSE, 1/4 ID x 25 Ft	1	B
23		.	CABLE, Welding, No. 7, 12 ft, 2-1/4 in.*	1	A
		.	CABLE, Welding, No. 7, 25 ft, 2-1/4 in.*	1	B
24	2310 1645	.	CONNECTOR ASSY	1	
25	2310 1643	.	SLEEVE	1	

\*Order by foot



P.O. BOX 486, UNION, NEW JERSEY 07083  
Division of Air Reduction Company, Inc. • Offices and Distributors in Principal Cities  
NV AIRCO CONTINENTAL SA • AIR REDUCTION CANADA LIMITED, Subsidiaries